

**IMPROVEMENTS IN OR RELATING TO CONTROL AND/OR
MONITORING SYSTEMS**

This invention relates to improvements in or relating to control and/or monitoring systems.

- 5 Reference throughout the specification should be made to the present invention in relation to security systems which are in fact control and/or monitoring systems.

BACKGROUND ART

- 10 An increasing number of security systems are being installed world-wide. Further, existing security systems are continually being upgraded as technology becomes smarter, more monitoring/control devices are available, and the desire for increased security increases.

One security device in which there has been considerable development is the video camera.

- 15 Previously, video cameras were used as passive means to monitor security situations. That is, the security video camera would capture images in its field of view and relay these to an operator on a security system who may be viewing a number of monitors or a single monitor showing views from multiple cameras.

- 20 The video camera has evolved further to have the ability to detect motion which can be defined as an alarm situation requiring some action or notification from the security system.

Some cameras have the ability to mask out sections of an image from the motion detection. For example, in a field of view there may be considerable motion happening such as trees moving in the wind, curtains blowing or traffic passing by a window. Thus these cameras allow the areas of the image to have motion
5 associated with them which does not trigger an alarm situation. The rest of the image however may trigger alarm situations as normal.

The operator of the security system can choose which sections can be masked out, but generally these sections are predefined. Further, there are limitations in that if motion is detected in a certain section that is not masked out, there is only one
10 possible response to that motion, generally an alarm signal. So effectively the image has on and off areas assigned to raising an alarm if there is motion or not depending on which area the motion occurs.

It would be desirable if there could be provided a security system that provides a greater flexibility than previous systems.

15 It is object of the present invention to address the above problems, at least to provide the consumer with the useful choice.

Further objects of the present invention will now become apparent from the following description which is given by way of example only.

DISCLOSURE OF INVENTION

According to one aspect of the present invention there is provided a method of operating a monitoring system using an image capture device, the method characterised by the steps of

- 5 (a) defining a number of sectors of a field of view of the image capture device, and
- (b) assigning independent monitoring and control parameters to each of the sectors.

Further embodiments of the present invention include a monitoring system which
10 is operable by the method as described above, hardware containing a set of instructions for operation of a monitoring system and a camera operable by the method claimed above.

The monitoring system may be any suitable security system or other type of monitoring system and it may in some embodiments be just a camera itself.

- 15 The image capture device again may be any suitable apparatus but for ease of reference throughout this specification it shall be referred to as a camera. In preferred embodiments, the image capture device is a digital video camera.

The field of view of the camera is the area that the camera sees when in its usual position.

The sectors in the field of view can be in preferred embodiments of the present invention any size, shape or number. For ease of use, it is envisaged that in one embodiment of the present invention the shape of the sectors will be rectangular.

However, it is an aspect of the present invention that the sectors can be any size
5 and of variable positioning and variable length to width ratio. It is a feature of the preferred embodiments that the sectors can overlap if desired by the operator. While the number of sectors need not be limiting, the applicant believes that having the ability to define approximately ten sectors is adequate.

Thus, the sectors may be chosen in a position to cover certain areas such as for
10 example, curtains, windows, doorways, security panels, trees, moving traffic, passageways and any other areas of interest in which it is desired to have monitoring and control parameters which are independent of other sectors.

Preferably, the sectors are independent of each other and are enabled simultaneously.

15 There may be a number of different monitoring parameters within the security system that could be assigned to each sector. The monitoring parameters are preferably event detection parameters.

For example, one event detection parameter that is assigned is motion detection. The actual threshold of motion detection may vary for each sector. For example,
20 the threshold for motion detection may be high in sectors which cover background movement, such as blowing leaves, curtains and traffic. The threshold for motion

detection may be lower in sectors which normally have no movement, such as valuable museum artefacts.

There may be other monitoring parameters as well. For example, there may be a monitoring parameter which is purely visual which does not take note if there is movement, but merely transmits the image to the operator of the security system. Another event detection parameter may not be movement, but may be a change of colour or light intensity. For example, a particular sector may be sensitive to the turning on or off of a light, for example, a security light.

As another example, the sector may be sensitive to lack of movement, for example when monitoring people, babies or animals.

There may be a variety of control parameters that is possible to assign to a sector as well. A basic control parameter may merely be the relaying of the image received by the camera in a certain sector to the operator of the security system. Another control parameter would be the signalling of a silent alarm to the operator of the security system or in some sectors may be other stages of alarm, such as an audible alarm and so forth.

Another control parameter may be the opening or closing of doors, windows or other security devices.

For example, a person may walk to a door corresponding to a sector in the field of view of the camera. One of the monitoring parameters in that sector may be face recognition. The control parameter may be to open the door if the face is recognised as that of a person allowed access through the door.

Another control option may be to operate other peripheral devices attached to the security system. For example, there may be provided an intercom attached to the security system which plays a message once a person enters a certain sector. Another control parameter may be motion tracking, turning the camera to follow movement that went originally across one of the sectors.

In some embodiments of the present invention, the operator of the security system may be able to pre-program a number of sectors according to the angle at which the camera is oriented. For example, the camera may have a usual orientation with standard images coming into its field of view. However, if the camera is used to track motion, and the angle of the camera is altered, another set of sectors may be required with the appropriate monitoring and control parameters for the new field of view.

In preferred embodiments, each sector can be disabled/enabled individually by either a pre-programmed schedule or by setting (arming) or unsetting (disarming) the security zones.

BRIEF DESCRIPTION OF DRAWINGS

The present invention will now be described for example only with reference to the accompanying drawings in which:

Figure 1 is the diagrammatic representation of one embodiment of the present invention.

BEST MODES FOR CARRYING OUT THE INVENTION

Figure 1 illustrates a possible field of view generally indicated by arrow 1, seen by a digital video camera (not shown).

In the field of view (1) there are a number of different items including a curtain (2) beside a window (3), a door (4) and an artefact generally indicated by arrow 5, and a passageway (6).

Each of the objects (2-6) have different sectors associated with them. These sectors are indicated by rectangles outlined in dash, with a dash-lined border. What should also be appreciated is that the area (7) of the field of view (1) which does not have a dashed rectangular border can also be viewed as a separate sector.

Each of the sectors (2-7) are independent of each other and enabled simultaneously. These all have different event definition and control parameters associated with them.

For example, sector (2) has a high threshold of motion detection associated with it as it is quite conceivable that the curtain may move in the wind. Sector (3) has a lower detection of movement associated with it so that the monitor is sensitive to movement of the window itself but less sensitive to movement outside of the window. If this sector (3) detects a gross motion, then the associated control parameter may be to signal an alert to the operator of the security system.

Sector (4) has no threshold of motion detection associated with it as any movement near the door may trigger a recognition sequence and possibly the control parameter may be to open the door if there is satisfactory recognition.

Any movement in the vicinity of sector (5) which is the artefact, may trigger an alarm situation.

It should be noted that sector (6) overlaps with sector (5) which is one of the useful embodiments of the present invention. While the sectors can operate
5 independently, there may also be configured in the software of the present invention recognition of inter-relationships between sectors. For example, movement in sector (5) will not trigger an alarm situation if there has been corresponding movement in sector (6) – there may only be an alert situation triggered then.

10 Sector (7) is significant in that it is the portion that is not defined by dashed rectangles. This sector may have no monitoring or control parameters or may have similar parameters assigned to it as in the other sectors.

Aspects of the present invention have been described by way of example only and it should be appreciated that modifications and additions may be made thereto
15 without departing from the scope thereof as defined in the appended claims.